

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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**PAT. & T.M. OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte ANDREW J. SANDERSON,
WAYNE EDWARDS, LOUIS F. CANNIZZO
and ROBERT B. WARDLE

Appeal No. 2004-0584
Application 09/436,360

ON BRIEF

Before WARREN, OWENS and KRATZ, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 1 through 13 and 43 through 47, all of the claims in the application. Claim 1 is illustrative of the claims on appeal:

1. An energetic thermoplastic elastomer having A blocks and B blocks and being present in a solid state suitable for use as a binder for at least one of a propellant, explosive, and gasifier, the energetic thermoplastic elastomer being formed from a composition comprising, as constituents:

A blocks terminated with isocyanate-reactive groups derived from monomers comprising one or more oxetane derivatives, the A blocks being crystalline below about 60°C;

B blocks terminated with isocyanate-reactive groups derived from monomers comprising at least one member selected from the group consisting of oxirane and derivatives thereof, the B blocks being amorphous above about -20°C; and

linking groups derived from at least one diisocyanate and at least one linking compound comprising two functional groups which are reactive with isocyanate moieties of the diisocyanate.

The appealed claims, as represented by the above claim, are drawn to a solid state energetic thermoplastic elastomer which is formed from a composition comprising at least, as constituents, A blocks, that are crystalline below about 60°C, terminated with isocyanate-reactive groups and derived from monomers comprising one or more oxetane derivatives; and B blocks, that are amorphous above about -20°C, terminated with isocyanate-reactive groups and derived from monomers comprising at least one member selected from the group consisting of oxirane and derivatives thereof, wherein (1) the A blocks and B blocks are end-capped with linking groups derived from at least one diisocyanate, and (2) the end-capped A blocks and B blocks are combined by reaction with at least one linking compound comprising two functional groups which are reactive with isocyanate moieties. Appellants disclose and claim that the claimed energetic thermoplastic elastomer are suitable for use as a binder for, *inter alia*, propellants, explosives, and gasifiers.(specification, page 1, and claim 1).

The references relied on by the examiner are:

Wardle	4,806,613	Feb. 21, 1989
Biddle et al. (Biddle)	4,976,794	Dec. 11, 1990
Hinshaw et al. (Hinshaw ¹)	5,747,603	May 5, 1998

The examiner has rejected appealed claim 4 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, and claims 1 through 13 and 43 through 47 under 35 U.S.C. § 103(a) as being unpatentable over Wardle in view of Biddle and Hinshaw.²

Appellants state that appealed claims 1 through 3, 5 through 13 and 43 through 47 “stand

¹ We note here that USPTO records show that Wardle, Biddle, Hinshaw and the present application are commonly assigned to Alliant Techsystems Inc.

² The examiner has withdrawn the obviousness-type double patenting rejection in view of the terminal disclaimer filed September 9, 2002 (answer, page 2).

or fall together” and that appealed claim 4 “stands or falls alone” (brief, page 7). The examiner assumes that appellants intend that claims 1 through 13 and 43 through 47 stand or fall together with respect to the ground of rejection under § 103(a), and that claim 4 stands or falls alone only with respect to the ground of rejection under § 112, second paragraph (answer, page 2).

Appellants do not disagree with the examiner’s position in the reply brief, and indeed, appellants do not separately argue the patentability of claim 4 with respect to the ground of rejection under § 103(a). Thus, we decide this appeal based on appealed claim 1 with respect to the ground of rejection under § 103(a), and on appealed claim 4 with respect to the ground of rejection under § 112, second paragraph. 37 CFR § 1.192(c)(7) (2002).

We affirm the ground of rejection under § 103(a), and reverse the ground of rejection under § 112, second paragraph.

Rather than reiterate the respective positions advanced by the examiner and appellants, we refer to the examiner’s answer and to appellants’ brief and reply brief for a complete exposition thereof.

Opinion

Considering first the ground of rejection under § 112, second paragraph, the initial burden of establishing a *prima facie* case on any ground under the second paragraph of § 112 rests with the Examiner. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992), citing *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984) (“As discussed in *In re Piasecki*, the examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability.”). In making out a *prima facie* case of non-compliance with this statutory provision on the basis that a claim is indefinite for failing to particularly point out and distinctly claim the subject matter which appellants regard as the invention, the examiner must establish that when the language of the claim is considered as a whole as well as in view of the written description in the specification as it would be interpreted by one of ordinary skill in the art, the claim in fact fails to set out and circumscribe a particular area with a reasonable degree of precision and particularity. *In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971). We find that when the plain language of appealed claims 1 and 4 is considered in light of the specification, see, e.g., *In re Morris*, 127 F.3d 1048, 1054-55,

44 USPQ2d 1023, 1027 (Fed. Cir. 1997), it is readily apparent that, as appellants contend (brief, pages 8-9), claim 1 requires that the A blocks must be crystalline *below* about 60°C, thus including A blocks which can be either crystalline or non-crystalline *above* about 60°C, including, therefore, A blocks that are crystalline below about 75°C to which claim 4 is limited. Accordingly, we reverse this ground of rejection.

Turning now to the ground of rejection under § 103(a), upon carefully reviewing the record on this appeal, we find ourselves in agreement with the supported position advanced by the examiner (answer, pages 4-6) that, *prima facie*, one of ordinary skill in this art would have found in the combined teachings of Wardle and Biddle the reasonable suggestion to use the oxirane derivative “Soft Blocks” polyglycidyl nitrate (PGN) and polyglycidyl azide (GAP) disclosed by Biddle for energetic elastomers, as the B blocks that are amorphous above about -20°C which are required for the energetic elastomers disclosed by Wardle, in the reasonable expectation of obtaining energetic elastomers having properties taught by Wardle and Biddle to be useful for binders for high energy compositions.

Accordingly, since a *prima facie* case of obviousness has been established over the combined teachings of Wardle and Biddle, we have again evaluated all of the evidence of obviousness and nonobviousness based on the record as a whole, giving due consideration to the weight of appellants’ arguments in the brief and reply brief. *See generally, In re Johnson*, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (Fed. Cir. 1984); *Piasecki, supra*.

The dispositive issue with respect to this ground of rejection is whether one of ordinary skill in this art routinely following the combined teachings of the applied references would have arrived at the claimed energetic elastomers by combining PGN and GAP with the polyoxetane derivative poly 3,3-bisethoxymethyloxetane (BEMO) by selecting either of the former from the list of nine (9) “Soft Blocks” and the latter from the list of twenty four (24) “Hard Blocks” in cols. 6-7 of Biddle, according to the teaching of this reference that

[t]hermoplastic elastomers of the (AB)_n type suitable for forming gun propellants in accordance with the present invention may be made from joining hard blocks and soft blocks from the following lists in the manner taught in the above-referenced U.S. patent application No. 07/174,665. [col. 5, line 65, to col. 6, line 20.]

We find that the “referenced U.S. patent application No. 07/174,665” in fact matured into Wardle, which would have taught one of ordinary skill in this art³ that A blocks, that are crystalline below about 60°C, terminated with isocyanate-reactive groups and derived from monomers comprising one or more polyethers derived from the cyclic ether oxetane, e.g., BEMO, and B blocks, that are amorphous above about -20°C, terminated with isocyanate-reactive groups and are polyethers derived from cyclic ethers, are (1) end-capped with linking groups derived from at least one diisocyanate, and (2) the end-capped blocks are combined via at least one linking compound comprising two functional groups reactive with isocyanate moieties (e.g., abstract, col. 3, line 47, to col. 4, line 41, col. 5, lines 3-4 and 47-50, and cols. 6-9). In this respect, we further find that Biddle teaches that “soft” or B blocks are “amorphous at room temperature, e.g., in the range of about 20° C. to about 25° C.,” and the “hard” or A blocks are “crystalline at room temperature,” both of which limitations fall within the same limitations for the same blocks in Wardle.

Thus, the reference to Wardle in Biddle provides substantial evidence supporting the examiner’s position because one of ordinary skill in this art routinely following the clear and specific direction in Biddle to use the “soft” and “hard” blocks disclosed therein according to the teachings of Wardle would have routinely arrived at energetic elastomers having the properties disclosed in the references, that fall within the appealed claims without recourse to appellants’ disclosure. *See generally, Merck & Co., Inc. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807, 10 USPQ2d 1843, 1845-46 (Fed. Cir. 1989) (“That the ‘813 patent discloses a multitude of effective combinations does not render any particular formulation less obvious. This is especially true because the claimed composition is used for the identical purpose. [Citations omitted.]”).

We fail to find in appellants arguments any position which convinces us that one of ordinary skill in the art would have found any other teachings in the combination of Wardle and

³ It is well settled that a reference stands for all of the specific teachings thereof as well as the inferences one of ordinary skill in this art would have reasonably been expected to draw therefrom, see *Fritch*, 972 F.2d at 1264-65, 23 USPQ2d at 1782-83; *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968); *Aller*, 220 F.2d at 458-59, 105 USPQ at 237, presuming skill on the part of this person. *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

Biddle, that is, this person would not have selected the necessary “soft” and “hard” blocks or would have been led in another direction by the disclosures in these references. We do not find such direction in the mere numbers of “soft” and “hard” blocks disclosed by Biddle as appellants contend (brief, pages 10-12; reply brief, page 3). Indeed, the clear teaching is that any one of the “soft” blocks can be combined with any one of the “hard” blocks to obtain an energetic elastomer following Wardle, that is, twenty four (24) elastomers prepared with each of PGN and GAP, wherein the two elastomers prepared with the “hard block” BEMO anticipate appealed claim 1. Therefore, we are of the opinion that the combined teachings of Biddle and Wardle would have placed the two energetic elastomers firmly in the possession of one of ordinary skill in this art, which, while not an anticipation in fact, speaks to the strength of the case of *prima facie* obviousness established by the examiner. *See Merck v. Biocraft, supra; cf. In re Saunders*, 444 F.2d 599, 601-02, 170 USPQ 213, 216-17 (CCPA 1971).

Thus, the disclosure of Biddle is not one from which one of ordinary skill in this art would have been led away by either the alleged “relatively low reactivity of the secondary hydroxyl group of GAP and PGN” (brief, page 12), nor by the difficulties that Hinshaw discloses with respect to GAP in col. 1 thereof (brief, pages 12-13), because the combined teachings of Biddle and Wardle would have taught one of ordinary skill in the art that these “soft” blocks will form energetic elastomers as set forth therein.

We need to discuss Hinshaw relative to our decision only to the extent that appellants rely on the admitted knowledge in the prior art appearing in the “background” statement by this reference as a “teaching away” from the claimed compounds (brief, 12-13). *See In re Kronig*, 539 F.2d 1300, 1302-04, 190 USPQ 425, 426-28 (CCPA 1976). The knowledge in the art that a compound used in the art may present problems in certain applications is not in itself a teaching away from the use of the compound in such applications, and thus the disclosure with respect to GAP in Hinshaw alone does not detract from the combined teachings of Wardle and Biddle. *See In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994) (“We share Gurley’s view that a person seeking to improve the art of flexible circuit boards, on learning from Yamaguchi that epoxy was inferior to polyester-imide resins, might well be led to search beyond epoxy for improved products. However, Yamaguchi also teaches that epoxy is usable and has

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